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Into Africa: The biography of Roman vessel glass in the Sahara Desert

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Abstract

The role of Roman vessel glasses that were traded to the central Sahara is presented, and their various social, material and cultural transformations are analysed from chemical and archaeological perspectives. In particular, the temporality of these objects, and the enabling and constraining factors of the desert trade by which they were transported, are considered as central factors in their interpretation. Their twentieth- and twenty-first-century recovery, conservation and current range of meanings are also discussed.

Introduction

> Geography can be a marvellous explanatory tool, so long as we avoid loading it with elementary determinism. It clarifies questions and formulates them, but it cannot resolve them. Men and their history complicate the picture and confuse the issue.
>
> (Braudel 1998, 157)

When we were approached to write a chapter for this volume, we considered how we could engage the interest of those working in the Mediterranean with this somewhat removed case study – of Roman vessel glass being transported into the heartlands of the Garamantes in Fazzan, central Sahara, well beyond the *limes* (see Figure 7.1). It struck us that the key to Roman glass in Fazzan is transformation: in use, value,

meaning and even physical and chemical transformation (of which more below). In the Sahara, the usual methodological constraints of archaeology – too few data points, the danger of constructing static pictures in representation of a dynamic past – are amplified by the vast geographical distances involved, making it a challenging testing ground for recently developed approaches to the dynamic past.

Key among the aforementioned approaches is object biography. Many of our most valuable means of interpreting the material record, including the use of chemical analysis as a tool for provenance, have the side effect of 'flattening out' the temporality of an object, by drawing a direct line between production and deposition. In order better to account for the temporal dimension of the objects, we take in this chapter a loosely framed biographical/prosopographical approach, attempting to reconnect as much as possible with the 'life story' of Roman glass in Fazzan, from its primary production to deposition, recovery and beyond. The biographical approach to material culture may be seen as one of a set of approaches in current archaeological thinking which consider the ways in which human and material interact and mutually transform one another (Gosden and Marshall 1999, 169–78). By focusing on a particular 'strand' of evidence – in this case, the glass objects themselves – it is also possible to incorporate many different analytical and methodological techniques into a single approach. A further level of appreciation may be gained by considering the ways in which objects' biographies were understood by those who encountered or used them in the past.

The glasses were recovered from urban sites and cemeteries in the Garamantian heartlands of Fazzan, south-west Libya (see Figure 7.2): first by an Italian team in the 1930s (Pace et al. 1951); then under the direction of Mohammed Ayoub, a Sudanese archaeologist, between 1961 and 1969; and finally by two British archaeologists, Charles M. Daniels from 1958–77, and David Mattingly with the Fazzan Project (1997–2001) and the Desert Migrations Project (2007–11) (Mattingly et al. 2007, 2010, 2013). The latter project was prematurely halted due to the outbreak of civil war in Libya. The vast majority of the excavated material remains in Fazzan, while the excavation records along with a small subset of the material – much of it from the work of Charles Daniels – are currently being stored in the Trans-SAHARA Project archives in Leicester.

The Garamantes are mentioned in Roman historical sources, in which they variously figure as nomadic raiders, providers of trade goods and a society whose main centre merited the apellation metropolis (see

summary in Mattingly et al. 2003, 76–90). The archaeological traces of the Garamantes are far more telling, and they present the story of an ethnically and probably culturally diverse oasis-based civilisation, which made use of advanced irrigation technology (*foggaras*). The most extensive pre-Islamic evidence for urban concentration and broader connectivity in Fazzan dates to the Classic Garamantian period, *c.*1–400 CE. Traces of Garamantian production activity, focused primarily on metal-working and bead-making, are evident at Saniat Jibril, a satellite village close to the capital of Garama (modern Jarma – see Figures 7.1 and 7.2), sited in the large oasis belt known as the Wadi al-Ajal (for details on this site, see Mattingly et al. 2010, 123–204). Local resources include carnelian, which was worked and certainly traded with the Romans (and perhaps also to the south), and mineral salts that could potentially have been used in, or traded for, glass- and soap-making (Devulder et al. 2014; Duckworth et al. forthcoming). A number of northern imports are present in Fazzan, including Roman ceramics (both tablewares and transport ceramics containing wine or other consumable goods), glass, metalwork and building materials.

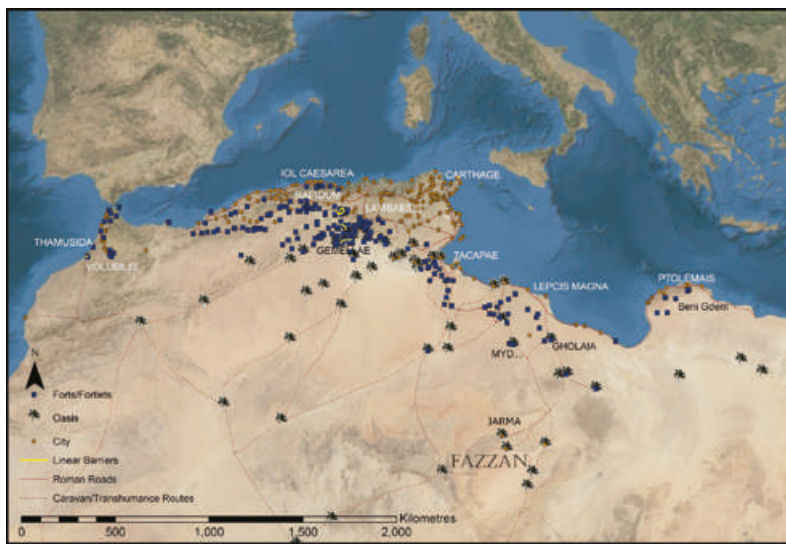

Figure 7.1 Map showing the cities of Roman North Africa, the line of forts that demarcates the *limes* and the most significant Saharan oasis sites. Map by Martin Sterry (originally published in Mattingly et al. 2013).

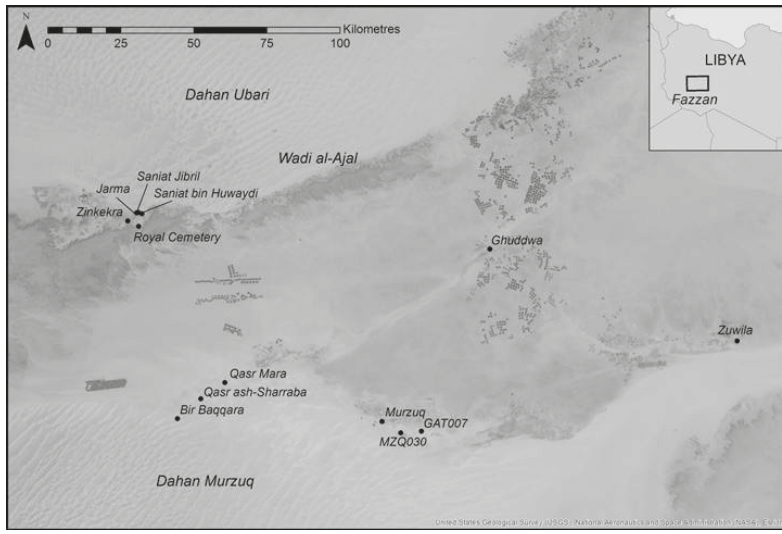

Figure 7.2 Map of Fazzan showing key Garamantian sites. Map by Martin Sterry.

There was almost certainly an equal or larger volume of less archaeologically visible commodities flowing into and out of Jarma, including textiles, dates, animals (the Romans may have procured wild beasts via the Garamantes) and human slaves. Remains of imports have been found in settlement contexts, notably Jarma itself, as well as at the manufacturing quarter of Saniat Jibril, but the majority (including all complete or near-complete glass vessels) were recovered from tombs, an example of which is shown in Figure 7.3.

The typology of the vessel glasses has been discussed extensively elsewhere, as have the first results of their chemical analysis, with further publications forthcoming (Duckworth forthcoming; Hoffman et al. 2010; Hoffmann 2013; Duckworth et al. 2016). We shall therefore limit ourselves to reporting some of the key facts here. Almost 2,000 fragments of vessel glass were found in Fazzan, the majority dating to between the first and fourth centuries CE, though vessel glass dating to as early as the first century BCE has been found. Table 7.1 summarises the locations in Fazzan from which Roman vessel glass has been recovered and the minimum numbers of vessels represented.

A range of typically Roman forms is encountered, including the so-called 'pillar-moulded' bowls of the first and early second centuries CE (see Figure 7.4), but relatively few glass storage vessels, and very

Figure 7.3 Garamantian burial at Taqallit cemetery 12, tomb 3 and selected grave goods including a glass rhyton (bottom left). Excavated as part of the Desert Migrations Project. The tomb contained both Roman and locally produced grave goods (such as the incense burner, centre right). Objects not to scale.
Source: composite image made by Chloë Duckworth using original photographs by Toby Savage, 2009

few perfume containers (making up 11.55 per cent and 2.22 per cent of the total assemblage, respectively). The compositional evidence for the vessel glass confirms that it was manufactured in the Roman world, using a mineral alkali such as natron. The glasses can be sub-divided into broad compositional groupings, which change in proportion over time: antimony-decoloured; manganese-decoloured; a group of glasses with both manganese and antimony; Roman blue-green glass; and HIMT (Duckworth et al. 2016, 635–8; Duckworth forthcoming).

Manufacture and provenance

Using a combination of typological assessment and compositional analysis, it is possible to make some propositions concerning the origin of the Roman glass from Fazzan, including changes over time. Birgitta

Table 7.1 Roman vessel glass in Fazzan, showing the minimum number of vessels of various types from the nine Fazzan sites with the most abundant archaeologically recorded glass remains

Name of site	*Type of site*	*1st century BCE to 2nd century CE cast*	*1st to 2nd century CE blown/mould-blown*	*Late 2nd to 5th century CE*	*Roman/Classic Garamantian, of uncertain date*
Jarma/Garama	Urban settlement (Garamantian capital)	>8 vessels	>3 vessels	>22 vessels	>80 vessels
Saniat Jibril	Urban settlement and manufacturing area	>7 vessels	>10 vessels	>21 vessels	>34 vessels
Saniat bin Huwaydi	Cemetery	>33 vessels	>8 vessels	>1 vessel	>4 vessels
'Royal Cemetery'	Cemetery	>5 vessels	>1 vessel	>43 vessels	>14 vessels
Zinkekra	Settlement and cemetery	>5 vessels	>4 vessels	None reported	>8 vessels
Watwat	Cemetery	>1 vessel	>3 vessels	>12 vessels	>4 vessels
Qasr bin Dughba	Settlement, *qasr* and cemetery	None reported	>1 vessel	>4 vessels	>4 vessels
Taqallit pyramid cemetery	Cemetery	None reported	None reported	>2 vessels	>2 vessels
Tinda	Settlement	>4 vessels	None reported	None reported	None reported

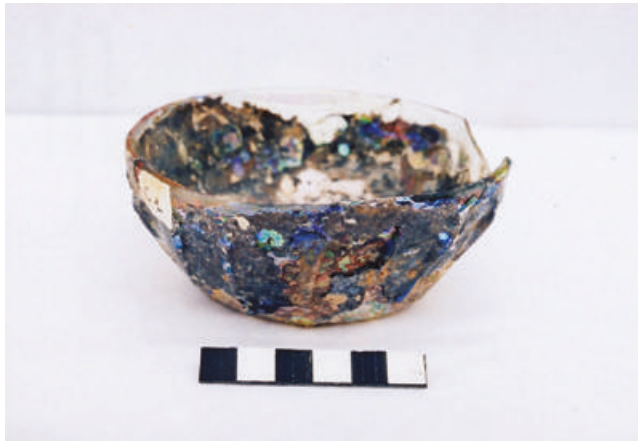

Figure 7.4 Highly corroded 'pillar-moulded' bowl in Jarma Museum. States of corrosion among the glass objects from Fazzan are highly variable, reflecting the different burial environments (from those close to irrigation systems, to those in arid zones) in the area.
Source: photograph by Birgitta Hoffmann

Hoffmann has made a thorough assessment of the glasses excavated by the Fazzan Project (Hoffmann 2013; Hoffmann et al. 2010), and we draw upon this work in our own discussion. The chemical analyses were conducted by Chloë Duckworth in 2014–15: further details of the methodology and results can be found in Duckworth (forthcoming).

Hoffmann notes that, among the pillar-moulded bowls from sites within the Jarma area, there is a very strong tendency towards a particular size, with diameters of 110–25 mm. She interprets this as, 'a conscious selection for carriage across the desert' (Hoffmann et al. 2010, 414). An alternative position is that the vessels were sourced from a relatively limited stock (e.g. from a single workshop and/or warehouse). We believe that the chemical evidence may support the latter interpretation, though we have regrettably few samples upon which to test this hypothesis. Three fragments of blue-green pillar-moulded bowls from the manufacturing area at Saniat Jibril were chemically analysed. As summarised in Table 7.2, they are remarkably close in composition, to the extent that they may well be from the same batch (they are sufficiently different in body and rim thickness to suggest they are not all three from the same vessel). Coupled with the aforementioned particularity in rim diameters, this may imply that the pillar-moulded bowls in Fazzan arrived in one or just a few shipments, perhaps from a single manufacturing centre. We are

Table 7.2 Analytical results for the three pillar-moulded bowl fragments from Saniat Jibril. Electron microprobe results are reported as oxides in weight percentage; laser-ablated, inductively coupled plasma mass spectrometry results are presented as elements, in parts per million

	Na_2O	MgO	Al_2O_3	SiO_2	P_2O_5	Cl	K_2O	CaO	TiO_2	MnO	Fe_2O_3	CuO
TSG082	15.5	0.64	2.37	69.9	0.14	1.36	0.60	8.97	0.05	0.34	0.34	0.00
TSG083	15.9	0.52	2.36	70.5	0.19	1.33	0.73	7.91	0.06	0.61	0.34	0.00
TSG084	16.5	0.47	2.43	71.1	0.13	1.52	0.54	7.38	0.05	0.51	0.31	0.00
	Li	**B**	**Ti**	**V**	**Cr**	**Co**	**Ni**	**Zn**	**As**	**Rb**	**Sr**	**Y**
TSG082	2.94	147	325	10.6	10.8	6.1	9.6	17.8	1.92	7.65	557	7.70
TSG083	3.68	106	351	13.4	9.7	18.3	10.7	21.7	2.09	7.99	492	7.33
TSG084	3.11	138	313	12.6	9.0	6.3	10.3	15.4	1.89	7.42	458	6.53
	Zr	**Nb**	**Mo**	**Sn**	**Sb**	**Cs**	**Ba**	**La**	**Ce**	**Pr**	**Nd**	**Sm**
TSG082	35.6	1.33	1.45	6.0	0.6	0.07	243	6.43	11.12	1.46	6.18	1.30
TSG083	37.0	1.41	2.34	12.6	92.9	0.08	255	6.23	10.97	1.40	5.97	1.33
TSG084	32.4	1.20	1.74	6.7	19.1	0.07	241	5.52	9.98	1.33	5.55	1.12
	Eu	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Pb**	**Th**	**U**
TSG082	0.34	1.51	0.21	1.17	0.23	0.72	0.09	0.64	0.09	6.7	0.83	0.93
TSG083	0.36	1.19	0.19	1.21	0.24	0.59	0.10	0.62	0.07	50.9	0.84	0.88
TSG084	0.38	1.27	0.18	1.23	0.23	0.65	0.09	0.61	0.07	16.1	0.73	0.65

cautious in this interpretation, however, given the notable homogeneity of Roman glass composition, often particularly prominent in blue-green glass, and in this category of vessel (Brill and Stapleton 2013, 328). In order to test this, we are currently investigating the full set of trace element results in the hope of identifying any further potential batch twins that may be present in the material from Fazzan.

Other dimensional curiosities were noted by Hoffmann among the glass from Fazzan. Two *modioli* from tombs in Saniat bin Huwaydi are – at almost 200 mm high – among the largest known glasses of this type (so large, in fact, that Hoffmann notes they could not have been lifted by their tiny handles without risk of breaking them). From the same cemetery came six tubular rimmed bowls, also of an unusually large size. There are also several colourless and dark blue glass plates with very large diameters up to 340 mm (Mattingly et al. 2010, 414–16). An exceptionally large plate diameter of 480 mm was recorded by Pace et al. (1951, 313 fig. 106), but the whereabouts of this object are now unknown.

Given that much of the early (first- to second-century) glass assemblage is more characteristic of the western than the eastern Roman empire (Hoffmann 2013, 417), the question arises as to whether it was shipped directly from secondary glass workshops in Italy, from somewhere in North Africa, or produced near the northern end of the Saharan trade route in Tripolitania. Although it is not possible to be certain, we feel that the last option is more likely, largely because the added cost of oversea transport would seem an unnecessary additional risk and expense, but also because the assemblage – while not entirely 'typical' – does offer some hints of similarities with other North African material. For example, cast conical bowls lack a cut line under the outside rim, in common with fragments from Benghazi (northern Libya). In addition, it might be noted that the amphorae from Fazzan have been identified as Punic and then Roman Tripolitanian, while the majority of the ceramic finewares were identified as African Red Slip ware, also produced in Tunisia (Victoria Leitch, pers. comm.).

In any case, this picture is hardly static. As noted by Hoffmann (2013, 416–19), the later Roman assemblage from Fazzan is markedly different, and may well have arrived via different trade routes altogether. While the first- to second-century assemblage is dominated by plates and bowls, the majority of the late third- to seventh-century glasses are beakers, cups and lamps, a substantial shift in glass usage in Fazzan 'which only partly reflects general changes of glass usage in the Roman Empire' (Hoffmann 2013, 416–19). Methodological difficulties in dating third-century ceramics and glasses prevent us from closely tracing the transition between these two

situations, but we may equally be seeing a hiatus in imports due to the political and economic situation in Rome. From the late third century onwards the glass assemblage is close in type and combination of vessel shapes to the western oases of Egypt, suggesting that by this period the usage of glass in Fazzan was more contemporary and 'Roman' than in the early phase. The compositional evidence supports this, with a significant proportion of the fourth- to fifth-century Roman vessel glasses falling into the so-called 'HIMT' (high iron, manganese and titanium) compositional group, which has been linked with production in Egypt (Freestone 1994; Freestone et al. 2005; Foster and Jackson 2009; Duckworth et al. forthcoming).

In addition, a greater proportion of luxury glassware is present in Fazzan in the later period, suggesting that the Garamantes were now tapping more directly into Roman valuation systems and possibly dining practices, perhaps via direct trade routes with the western oases of Egypt. In order to properly assess the value of the glassware, however, we must consider how it was received in Fazzan as well as its value while still in the Roman sphere of influence.

Trade and transport

We are discussing objects that moved between presumably very different cultural contexts, and that at some point passed between different systems of valuation. A key proposal made by Appadurai is that, 'the commodity situation in the social life of any "thing" be defined as the situation in which its exchangeability (past, present, or future) for some other thing is its socially relevant feature' (Appadurai 1986, 13). But what was the place of glass vessels in the two intersecting spheres of valuation, and at what point did they cross from one to the other?

In the Roman Mediterranean, it was common practice for a wide range of goods – and not just luxury items or foodstuffs – to be traded over long distances. This is true of glass, too, but only to an extent: it seems that, while large quantities of 'raw' glass, or broken glass cullet intended for recycling were traded across the Mediterranean (Fontaine and Foy 2007; Silvestri 2008, 1499), everyday glass objects were often made more locally, in secondary workshops throughout the empire.

The journey from the Mediterranean ports of Oea and Lepcis Magna to Jarma was *c.*1,000 km, a 30-day trek across difficult terrain. Glass must have been one of the most difficult materials to transport intact and this fact may have added extra value to the artefacts that survived the trip. Few of the objects found in Fazzan – particularly in the

first- and second-century contexts – would have been counted among the most expensive glassware in the Roman world. The seemingly paradoxical selection of large vessels, despite their inherent fragility, surely reflects a Garamantian interest in exploiting the prestige value of this remarkable material, while for Mediterranean-based merchants, the preference for relatively cheap products that met the size criterion was a sensible investment in stock that would have had a high breakage rate in transit. The commercial value of the intact vessel glass that reached Fazzan was presumably inflated well above its cost at Mediterranean ports. This is also echoed to some extent in the ceramic evidence: as discussed by Victoria Leitch (Leitch et al. in press), mass-produced and quite large, open ceramic bowls were much more common than easier to transport cups. The merchants again sought to offset the difficult transport of larger forms by including some stock that show signs of being 'seconds', and this tendency was equally clear in the second condition of some of the first- and second-century amphorae, evidently selected purposefully for the hazardous cross-desert trip. Perhaps the best conclusion we can draw from these strands of evidence is that the consumer tastes of the Garamantes – in both form and size of vessels – were an important factor in the nature of vessels transported to their capital, but that merchants had strategies for maximising their profits in such exchanges. It is also apparent that the sources of Roman goods in Fazzan were relatively limited, perhaps the output of just a few manufacturers, or the stock of a small number of merchants, at any given time.

From a Garamantian perspective, it is fairly safe to assume that the mechanism by which glass reached Fazzan would have had a significant impact upon its perception, value and meaning. Indeed, the issue of transportation must lie at the centre of our analysis of these objects, because the Sahara has variously been seen as an inhospitable barrier between north and south, and a desert 'sea' linking the regions on its shores (Lecocq 2015, 23–4; Lydon 2015, 3–4). More rarely, the geographical and cultural variability and dynamics of the Sahara itself have been considered (Scheele 2012; Mattingly et al. in press).

The enduring image of Saharan trade is that of the camel as pack animal (see Figure 7.5). Camels were present in North Africa from at least the later first millennium BC, and were present in the Sahara by the early first millennium AD, with some of the earliest known Saharan camel bones (*terminus ante quem* second century AD) excavated in Jarma itself (Fothergill et al. forthcoming). Prior to the use of the camel, the only pack animals capable of transporting goods across the Sahara would have been donkeys and mules or hinnies. These animals continued in use alongside

Figure 7.5 Terracotta figurine of a camel carrying transport amphorae. Late second to early third century CE. Egyptian. Height 11.8 cm. Source: OASC image courtesy of The Metropolitan Museum of Art (www.metmuseum.org), gift of Mrs Lucy W. Drexel, 1889, accession number 89.2.2093

camels until recently. Horses were also used in the Sahara, and are depicted pulling chariots in rock art from Fazzan (Barnett and Mattingly 2003), and may have been suitable in raiding activity due to their speed, but would have made rather expensive and demanding pack animals.

Camel-breeding imposes a pastoral lifestyle, and Bulliet argues that the camel could only become an efficient means of transport in the Middle East once nomadic camel breeders had been successfully integrated with settled society and economy (Bulliet 1975, 90–1). Traders and camel-driving pastoralists were not necessarily one and the same people, and the need for local guides in an inhospitable environment means that changing of pack animals several times during a journey may well have been a necessity.

The regional level of organisation this implies has been highlighted in recent interpretations of Saharan trade. Andrew Wilson suggests that Saharan, or trans-Saharan trade should be viewed in terms of a network of independent sub-systems *within* the Sahara; of short-, medium- and long-distance exchange (Wilson 2012). Anthropological work on nineteenth- and twentieth-century Saharan trade similarly highlights the importance of the regional exchange of locally produced goods, and the significance of pastoral routes, dictated by the dietary needs of camels,

over direct 'trade routes' in the movement of goods from one location to another (Scheele 2010, 298).

It might therefore be argued that the use of pack animals imposes additional degrees of separation between the Garamantes and the Roman world to the north. Local guides would have been needed at every stage in order to traverse the difficult Saharan terrain from the *limes* to Jarma, a journey that would have been divided into stints of a maximum of 10 days each between major wells or water sources, by most reckonings (Mattingly forthcoming). Water sources may have provided more or less permanent staging posts, but the need for pack animals to graze would also have affected trade routes, which may have varied from season to season (Scheele forthcoming). In short, while it is possible to argue for permanent stopping points at various oases, which may have formed long-term nodes on the map of trans-Saharan trade, it is not possible to delineate static trade routes between these: the dotted lines on Figure 7.6 represent hypothetical means between an ever-changing range of routeways.

Despite this, the exceptionality of the Garamantes' trade with Rome is demonstrated by the virtual absence of Roman vessel glass at other Saharan sites (with the notable exception of the tomb of Tin Hinan, see below). This suggests that Roman goods were traded directly to Fazzan,

Figure 7.6 Key sites of relevance to trans-Saharan trade, with hypothetical trade routes in dotted lines. It should be noted that this static image cannot capture the dynamic and multiple systems in operation at any given time, and that the 'routes' themselves would be neither direct nor fixed. Map by Martin Sterry.

rather than arriving in a 'down the line' manner; further evidence that the Garamantes had a strong hand in the selection of the material culture that made it to Fazzan. Packs may well have been put together in a Roman harbour town such as Lepcis Magna and not dismantled until they reached Jarma: one of us (David Mattingly) has suggested that glass and ceramic finewares may have been wrapped in bales of textiles, which were also a key commodity of trans-Saharan trade, certainly in the Islamic period, and quite possibly before this time (Mattingly and Cole forthcoming). While trade goods and even traders themselves may have travelled the whole route, their guides and pack animals may well have changed several times. In order to ensure safe passage, traders would thus have required either highly stable mutually beneficial trade agreements, or a fair degree of military might.

Did this risky and presumably expensive method of transport render the Fazzan glass of exceptionally high status? It was certainly of limited distribution, even within the Garamantian heartlands. As shown in Figure 7.7, excavated vessel glass was preferentially located around Jarma, the Garamantian capital, and in some of the higher status tombs. Due to a combination of factors, but most significantly, looting in antiquity, and the small percentage of tombs excavated to date, we cannot push very far the significance of the recorded glass finds in terms of burial site or tomb type. We can note that glass had a similar, but more restricted distribution in Fazzan to that of Roman pottery, shown in Figure 7.8. The political centralisation of the glass

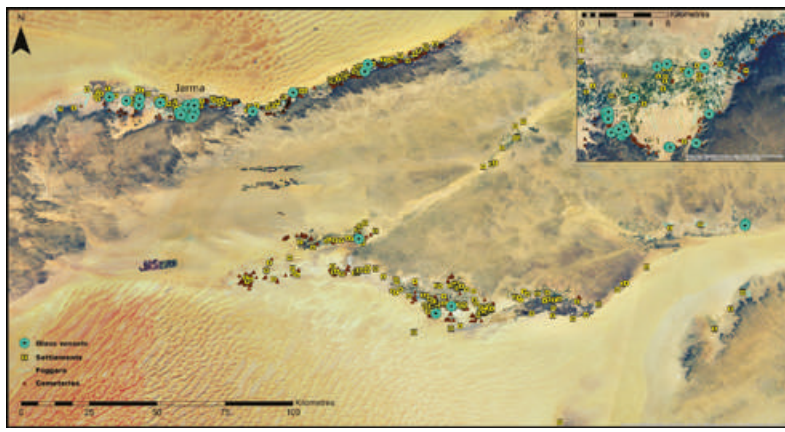

Figure 7.7 Roman glass vessel finds in Fazzan with (inset) detail of the Jarma area. Map by Martin Sterry.

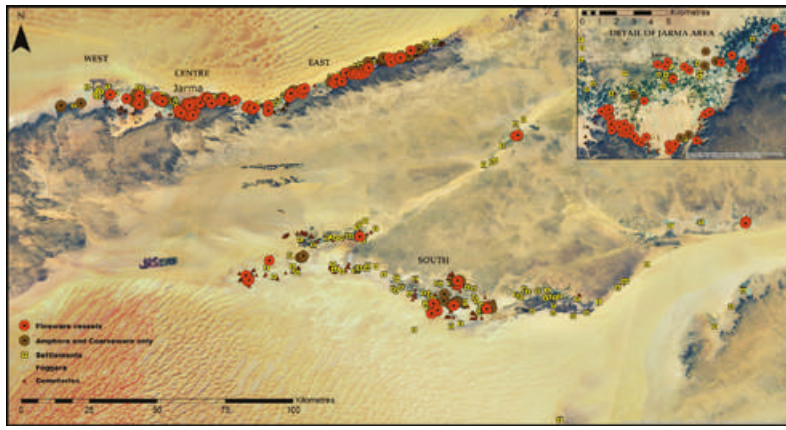

Figure 7.8 Roman pottery finds in Fazzan with (inset) detail of the Jarma area. Map by Martin Sterry.

distribution patterns could imply that it was redistributed as a gift within Fazzan itself.

Roman glass vessels are not generally encountered far south from Fazzan, at least not in their original form (the matter of recycling into glass beads is considered below). No vessel glass has been found in Fewet, the closest region south of the Garamantian heartlands, although glass beads were encountered and have been analysed (Verità 2013). Roman glass is found in Sudan but would almost certainly have arrived there via the Nile or Red Sea trade routes. West African sites have yielded some evidence for glass beads and vessel glass, but any vessels post-date the Roman/Classic Garamantian periods, so we cannot find any significant evidence that Roman glass vessels were traded on from Fazzan. Central Saharan consumption of Roman vessel glass appears – at least on the present (and admittedly rather slim) evidence – to have been a Garamantian phenomenon and exceptional finds, as at Tin Hinan, are just that and could have been the product of rare gift exchange between the Garamantes and leading individuals in neighbouring groups. The same pattern also holds for Roman ceramics, as shown by the work of Victoria Leitch (Leitch et al. in press; see also Figure 7.8).

Despite all this, glass vessels were clearly not among the most restricted luxuries in Garamantian society. The sheer volume of glassware uncovered in the small number of excavations to date (by comparison with other materials in Fazzan and with other non-Roman sites in

Africa), and its finding in both tombs and urban contexts, suggests that large quantities of it were imported into Fazzan. At least some of this may have been earmarked for re-use, as evidenced by its presence in the manufacturing quarter of Saniat Jibril.

Use and re-use

> Following objects beyond the point of manufacture, purchase or gift also shows that traces of former property relations remain … ritualised attempts to sever previous relations and recast the objects and exchange relations anew indicate the labour needed to exorcise previous lives of things. It is not, *contra* Appadurai (1986), simply a matter of objects moving between gift and commodity relations. Things hang in limbo, are stored in warehouses, are dismantled, bear vestiges of earlier incarnations.
>
> (Alexander and Reno 2012, 22–3)

Depending on what we are trying to reconstruct, there may be problems with focusing on a single category based on the material from which it was made. Roman tablewares, for example, are best interpreted as a set regardless of whether they are made from ceramics, glass or metal. On the other hand, material constraints are highly significant when considering the context of production, and this is certainly true of glass, which required extremely specialist facilities and technical knowledge to produce. A key point to recognise here is that for recyclable materials such as glass, production – that is, making – can occur at several stages, as glass objects are broken, re-melted, and transformed.

Of course, we cannot assess the volume of vessel glass that may or may not have been recycled in Fazzan without more data on the composition of glass from Saharan and sub-Saharan sites. But we can look for clues as to whether it was being recycled or not. The most prominent among these is the presence of glass fragments at the manufacturing site of Saniat Jibril, and of glass production waste or glass bead wasters at several sites (Jarma, Saniat Jibril, Zinkekra and Zuwila), examples of which are shown in Figure 7.9. The glass bead wasters were found at the surface, in Zuwila, which is some distance from Jarma, and are probably the product of later activities than those considered here (see Duckworth et al. 2015, 8–10).

One of the key activities at Saniat Jibril (occupied from the first to the early fifth century AD) was the production of beads of various

Figure 7.9 Examples of vitreous production remains from sites in Fazzan. Clockwise from top left: chunk of vitreous production waste adhering to buff-coloured calcareous material, from Jarma (context dated to late first century CE); 'raw glass' chunk from Saniat Jibril (first to fourth century CE); glass drip or spill from Zinkekra (probably late first century CE); traces of blue glass adhering to sherds of local ceramics from (late second to fourth century CE); mis-shapen beads and bead-forming tube found during surface collection survey at Zuwila.

materials (including carnelian and ostrich eggshell). A number of bead-grinders – stone or ceramic used as an abrasive surface against which to work a bead to shape – were also found. Is it possible that the glass fragments from Saniat Jibril were being ground or even re-melted into beads at the site? At present it is difficult to say. Some 820 partial or complete glass beads have been recovered in Fazzan to date. Of these, 444 are from dateable contexts of the Classic Garamantian (1–400 CE) or late Garamantian (post-400 CE) periods. All come from tombs, and 375 of them come from just 10 tombs. Because most of them were excavated as part of the Desert Migrations Project, which was interrupted in 2011 with the onset of civil war in Libya, we have very little data on their forms, although the onsite specialist did identify among them one Indo-Pacific and 10 Indian red beads (Franca Cole, pers. comm.).

The chemical evidence, however, does shed some light on the matter. The majority of the beads available for quantitative analysis were gathered by Charles Daniels during surface collection survey. They include eye beads and plain, wound beads and based on find location

and typology, date to between the last few centuries BCE (e.g. eye beads from Zinkekra) and the first to fourth centuries CE. Most are in various shades of blue or green; while the eye beads also feature applied decoration in opaque white, blue and yellow. There are also several beads that are almost certainly later European and Indian imports, and the analysed fragments of these have compositions consistent with the use of plant ashes as a flux.

As shown in Figure 7.10, even among the mineral fluxed 'Roman' glasses, many of the analysed beads – along with the vitreous production waste from Jarma (which may have been waste from glass production – see Duckworth et al. 2016, 637), and an imported glass stirrer – do not contain antimony or manganese in appreciable quantities. As comparison with the Roman vessel glass illustrates, this indicates that these particular objects are not the result of recycling Roman vessel glass.

Other samples shown in Figure 7.10, however, are potentially compatible with recycling of the sorts of Roman vessel glasses found at the site, for example with 1.09–1.65 per cent antimony pentoxide (Sb_2O_5) in three samples of differently coloured glass taken from a single bead. Another bead has elevated amounts of both antimony (0.59 per cent Sb_2O_5) and manganese (0.88 per cent MnO). Perhaps most interestingly, the chunk of 'raw' glass from Saniat Jibril also features slightly elevated manganese and antimony (0.14 per cent MnO and 0.74 per cent Sb_2O_5), the most likely explanation for which is the melting together of

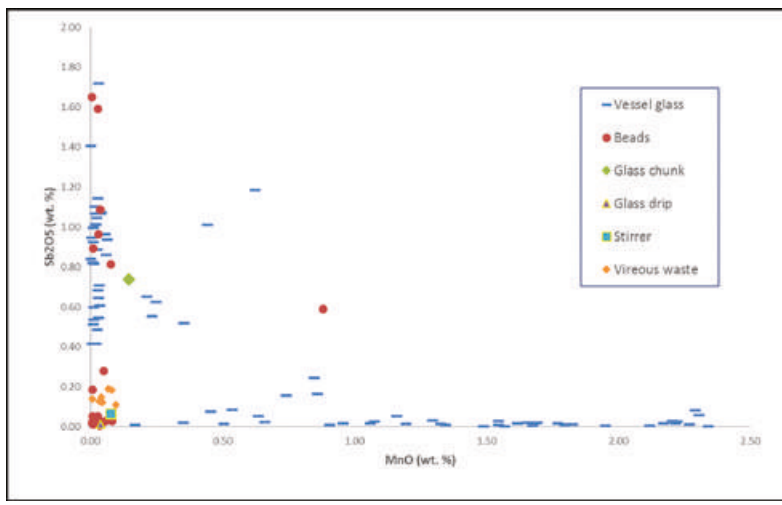

Figure 7.10 Manganese (Mn) plotted against antimony (Sb) for vessels and beads from Fazzan, given in parts per million (ppm).

antimony-decoloured and manganese-decoloured Roman vessel glasses. Some of the glass vessels themselves also feature this hybrid manganese-antimony composition, and it is not clear whether the chunk was the product of recycling elsewhere, with chunks of glass being traded into Fazzan, or whether it was the result of locally mixing vessel glass cullet like that found at Saniat Jibril. Either way, the presence of a chunk of raw glass in Fazzan is a very strong indication that some form of glass-working activity was taking place in the area.

To what extent does a physically recycled object retain traces of its former 'life'? Certainly the Garamantes – or some element(s) of their society – were aware that glass could be melted and reworked in a hot state, which must surely have affected its perception and value. How far this awareness of the provenance of the material extended beyond Fazzan is unclear. We do know that beads of a very wide range of provenances turn up at West African sites in increasing numbers throughout the first millennium CE (though there is almost no evidence for the first to fourth centuries CE); the extent to which the exoticism of the beads was valued as distinct from their material properties remains, however, unclear.

Curation, fetishism and discard

What then, of the transformation in meaning and value of glass objects over time? The possibility of curation must be considered as a potential source of discrepancy between dates of production and discard, but also as a factor in the treatment of objects after excavation. The term 'fetishism' is itself somewhat problematic, originally rooted in racist, colonialist discourse and later extended in various directions by a number of influential thinkers (Pietz 1985, 5; 1987, 23–4). We use the term here to refer to the perceived endowment of an object or class of objects with powers external to it. In particular, we are interested in the ascription of intrinsic value to objects based on their history.

It is in fact remarkably difficult to assess the degree of curation of glass vessels in Fazzan in the first millennium AD, though our best chance to do so certainly lies with the cemetery evidence. Some of the glass plates with large diameters were initially thought to indicate curation (Hoffmann et al. 2010, 414), but – as pointed out by Jennifer Price (pers. comm.) – examples of very large plates have been found in later (fourth- to early fifth-century contexts) elsewhere (see, for example, Nenna 2003, 94). There are hints of curation elsewhere, but none of these can be verified at present. A mould-blown glass beaker from Saniat bin Huwaydi is

thought to date to the first century AD, but the tomb in which it was found was dated by Ayoub to the later third century AD. On the other hand, recent AMS dates for several of the glass-bearing tombs excavated as part of the Desert Migrations Project accord well with the dates assigned to the glass on the basis of typological comparison with various parts of the Roman world, suggesting that lengthy curation may not have been practised.

Of course, the life history of these objects did not end when they were deposited in the ground. The very act of deposition may have served to demarcate ownership. There is a notable association between cemeteries and the location of the complex, high labour-investment *foggara* irrigation systems and glass vessels are preferentially distributed – along with other Roman imports – in some of the richest cemeteries, though glass vessels are not a ubiquitous feature of the richest burials. Nor were the locations of tombs – which were often highly visible – forgotten by subsequent generations: looting may have taken place in several periods, as illustrated by the recently obtained AMS radiocarbon dates, that seem to indicate robbing of tombs in late medieval and early modern times. This is not unprecedented. In Algeria, the fourth-century burial of a woman known as Tin Hinan, near Abalessa, has long had legendary associations among the Tuareg. Among the richly furnished grave goods was a glass goblet, presumably Roman in origin (Thiry 1995, 451).

Once 'out of the ground', these long-curated objects entered a new phase. The majority of the individuals who have been involved in archaeological research in Fazzan have had backgrounds in Roman archaeology, so the presence there of Roman-made objects has had a direct impact upon its interpretation and perception. It is interesting that the very first archaeological work to put Fazzan on the international map was done by Italians during the Colonial Period (1911–51), when the pottery and glass were simplistically presented as evidence of the 'Romanisation' of the Garamantes. Ayoub, too, was a foreigner in Fazzan, albeit one with a different geographical bias (he came from Sudan). His interpretation of Jarma ties it very closely to the Roman world, to the extent that he believed it was uninhabited prior to the first century CE (see Mattingly et al. 2013, 20–1).

Today, the glass is arguably more valuable and symbolically endowed than ever. Its physical fragility coupled with chemical durability are emblematic of the partiality of the material record. In the age of chemical analysis, even the tiniest fragments of a material take on a new significance – indeed, this may be seen as the ultimate fetishism, with the object and sample standing for much more than their present form. On

the one hand, the principles of conservation imply that the removal of even a small portion of an object for analysis is a destructive, rather than constructive act. A common argument against sampling references the future potential of the object (for example, the possibility of developing better non-destructive analytical techniques in years to come). Reference to the future, which is understood as infinite, endows the object with potentially limitless power to inform us about the past. On the other hand, when destructive analysis is permitted and conducted, the removed fragment itself is imbued with a potent representative meaning in its own right. The use of the term 'sampling' to refer not only to the removal of part of an object, but to the selection of objects as representative of a category or assemblage, further extends this. Archaeological objects, and the data derived from them, become points on a map, their significance magnified by the reduced dimensions of cartographic representation, including its timelessness.

Jean Baudrillard argues that the antique in the modern world is symbolic of time itself, of 'history simultaneously invoked and denied' (Baudrillard 1996, 78, fn 2). In the context of the museum, we might argue that the curation of the material record stands for control; over nature, humanity, even time. Without wishing to extend the parallels too far, it is worth noting that the majority of the Garamantian grave goods – many from cemeteries associated with particular irrigation systems and quite possibly demarcating ownership over land and water resources as argued above – are now under serious threat of destruction in Jarma Museum. The museum was a recent target of Tuareg attacks as they attempt to assert their own new political authority in a valley that has been the preserve of sedentary oasis cultivators for three millennia.

Conclusion

The approaches advanced here – namely, the application of object biography and prosopography – generate as many questions as they do answers in the study of these fluid objects and the material – glass – of which they are made. But they at least have the merit of bringing the issue of temporality to the fore, and preventing the material record from appearing static and unchanging. They also highlight just how many gaps there are in our knowledge, in spite of the excellence of archaeological science.

Perhaps the most important point to raise is just how vulnerable archaeological remains become once they have been excavated;

vulnerable not only to physical deterioration, loss or destruction, but to misinterpretation, de-contextualisation or mis-use. Needless to say, our own discourse stems from Western, Eurocentric prioritisations and can be questioned on many fronts. The vessel glass from Fazzan has lasted a long time and has retained a remarkable degree of its Roman identity throughout. It has travelled far through both space and time, but we should not forget that it is travelling still.

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